IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	Group Art Unit 2872
	)	
Lenny Lipton et al.	)	Examiner: Audrey Y. Chang
	)	
Application No. 09/943,890	)	
	)	
Filing Date: August 30, 2001	)	**APPELLANT'S BRIEF**
	)	
For: Autostereoscopic Lenticular Screen	)	

CERTIFICATE OF MAILING

I hereby certify that the correspondence enclosed herein is being deposited as first class mail with the United States Postal Service on April 22, 2005, in an envelope addressed to: Mail Stop Appeal Brief – Patent Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Dated: April 22, 2005 By: Magdalena Blackmer

Mail Stop Appeal Brief -- Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the final rejection of the Examiner dated September 24, 2004, in the above-referenced application.

Real Party in Interest

The real party in interest is StereoGraphics Corporation, a wholly-owned subsidiary of RealD, and an assignment of the application to StereoGraphics Corp. is recorded in the USPTO at Reel 012313 and Frame 0805.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of the Claims

Claims 5-21 are pending, and claims 1-4 and 22 have been cancelled without prejudice. A complete listing of the claims as pending is reproduced in the Appendix. The final rejection of claims 5-21 is the subject of this appeal.

Status of Amendments

Appellants have filed an amendment after final rejection concurrently with this brief. The amendment has not yet been entered but does not change the substantive issues on appeal.

Summary of Invention

An autostereoscopic display system has a lenticular screen arranged in juxtaposition with a display screen. The system is switched between a planar viewing mode and a stereoscopic viewing mode by having a closed chamber formed between the lenticular screen and the display screen, and then introducing or removing an optically clear fluid to/from at least a portion of the closed chamber. The introduction of the optical fluid into the chamber neutralizes the optical effect of the lenticular screen thereby allowing the user to observe planar images. The removal of the optical fluid from the closed chamber restores the optical effect of the lenticular screen thereby allowing the user to observe stereoscopic images.

Description Of The Invention

Figure 4 of applicant's specification (reproduced below) shows a user 306 observing content on an electronic flat panel display 404 through a lenticular screen, which is held in juxtaposition with the surface of the display. [0025] The surface of the display 404 is protected by a clear cover glass 405. [0025] The lenticular screen typically includes a substrate 401, preferably glass, with lenticules 402 deposited onto one side of the substrate, [0025], although the substrate and lenticules could be integrally formed of a single material. [0020] The other side of the substrate has an anti-reflective coating 403 applied thereto, for example, by well know thin film methods. [0025] The lenticules 402 are a plurality of cylindrical portions arranged in parallel, forming a corduroy-like surface that refracts images in a well know manner. [0020] Preferably, the lenticules 402 are arranged to face inwardly toward the surface of the display,

with an air gap 406 between the two. [0025] The air gap may be relatively large, or it may be as small as the interstices formed by the rounded tops of the lenticules 402 touching the face plate 405.

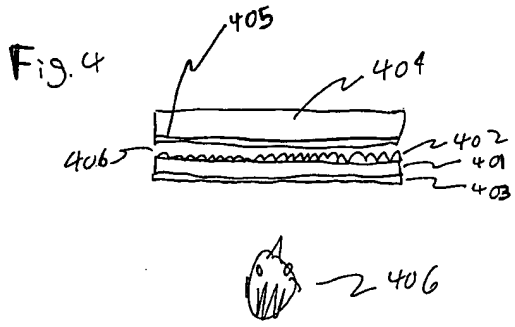

Figure 5 (reproduced below) shows the construction of a closed chamber 500 that is used is association with the lenticular display of Figure 4 and formed in the gap 406 between the lenticules 402 and the cover plate 405. [0026] The chamber is formed when the lenticular screen is mounted to the display by sealing the entire outer edge 503 to prevent liquid from escaping. [0027]. Fitted to the lower edge are ports 504 for introducing and removing a liquid from the chamber. [0026-0027] The liquid must have an index of refraction that is similar to that of the lenticular material. [0029] At the top edge, ports 509 are provided to communicate between the chamber 500 and an expansion chamber 505, which is provided to contair air which is displaced from the chamber 500 by the introduction of fluid. [0026-0027] The fluid in introduced and removed from the chamber 500 by means of a syringe 507 with a handle 508, which is fitted onto the bottom of the display bezel. [0030] However, other well known methods could be used.

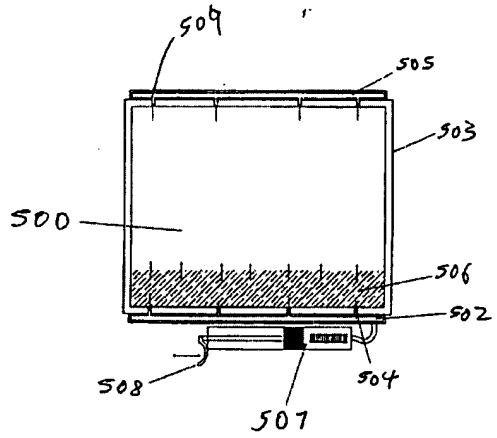

Fig. 5

Issues

1. Is the Examiner in error in rejecting Claims 5-7, 8-10, and 12-20 under Section 103(a) as unpatentable over U.S. Patent No. 6,069,650 ("Battersby") in view of U.S. Patent No. 6,288,846 ("Stoner")?

2. Is the Examiner in error in rejecting Claims 11 and 21 under Section 103(a) as unpatentable over the combination of Battersby and Stoner and further in view of U.S. Patent No. 6,046,855 ("Goto")?

Grouping of Claims

The rejected claims stand or fall together.

Argument

I. INTRODUCTION

The Examiner asserts that Battersby teaches all the elements of rejected claims 5-9 and 12-20, except that "[t]his reference however does not teach explicitly that the liquid crystal material is *introduced into or removed from* the chamber to achieve the changing function of the

lenticular means." (Paper No. 5 at p. 6; Paper No. 8 at p. 3)(emphasis in original). However, this is precisely the point of novelty asserted by applicant, namely, the introduction and removal of an index matching liquid to cause the optical effect of the lenticular screen to be active (when the liquid is removed from the chamber) or neutralized (when the liquid is added to the chamber).

Applicant submits that the the Examiner has failed to make a prima facie case for obviousness of the claims at issue, that the combinations proposed by Examiner are inadequate to render the claims unpatentable, and that applicant's claims are only obvious through the improper use of hindsight reasoning.

II. APPELLANTS' CLAIMS ARE PATENTABLE OVER THE COMBINATION OF BATTERSBY AND STONER

A. The Teachings of Battersby

Battersby discloses a specific technique for switching a display between stereoscopic and planar viewing modes using electrically switchable liquid crystal material. Fig. 3 of Battersby shows the use of liquid crystal material 38 sandwiched between a glass plate 36 and a lenticular sheet 30. The glass plate 36 and lenticular sheet 30 are covered with thin layers 37 and 34, respectively, of conductive material, such as ITO, to act as electrodes. Seals are provided around the periphery of the lenticular sheet to retain the liquid crystal material. (Col. 5: 11-44).

The selective application of an electrical potential to electrodes 34 and 37 causes the physical/optical orientation of the liquid crystal material to change in a well known manner. With no potential applied, the refractive index of the liquid crystal differs (i.e. is lower) from the refractive index of the lens sheet and the lens sheet operates in its normal manner to refract images and provide a stereoscopic viewing mode. When a potential is applied, the refractive index of the liquid crystal now matches the refractive index of the lens sheet, and the lens action is neutralized such that the images are not refracted but merely transmitted through the lens sheet to provide a planar viewing mode. Thus, the refractive nature of the lens sheet is in effect turned off and on by the application and removal of electrical potential to the electrodes to thereby drive the liquid crystal between its two states. (Col. 5:50 – Col. 6:14).

B. The Teachings of Stoner

Stoner discloses a technique for providing a variable focal length for lenses in an optical system. Stoner describes a system having a pair of optical lenses that are separated by a small distance or space. The optical properties of the system are changed by filling the space between the lenses with an index-matching optical liquid, and the optical properties are restored to their normal condition when the liquid is removed. (Cols. 3:39-56, 5:9-19, and 8:20-32).

In the backround of the invention, Stoner notes that "[i]nterocular lenses have also been envisioned with focal properties varied by amount or type of injected fluid, or by voltages applied to liquid crystals, or by holographic fragments." (Col. 2:25-29) However, Stoner goes on to note that the use of liquid crystals is problematic because they have a limited range of refractive index available due to the change in electric fields, they require thick layers of the optical fluids, and it is difficult to produce the precise distribution of high voltages to enable effective focusing. (Col. 2:30-52).

C. *The Combination Of Battersby And Stoner Does Not Render Obvious Claims 5-7, 8-10, And 12-20*

1. The Examiner Did Not Establish Prima Facie Obviousness

In each of the 3 office actions of record, (Paper No. 5 dated 23-Apr-2003; Paper No. 8 dated 2-Jan-2004; and Paper No. 10 dated 24-Sep-2004), the Examiner makes general arguments about what the Battersby and Stoner references teach, which are then implicitly applied to the three independent claims 5, 8, and 18. However, applicant submits that the Examiner has failed to make a prima facie case for obviousness because there is no adequate teaching, suggestion, or motivation to combine these references either explicitly or implicitly in the references themselves or the general state of the art.

The standard for making an obviousness rejection is set forth in MPEP 706.02(j):

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both

> be found in the prior art and not based on applicant's disclosure. *(citations omitted)*
>
> The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

The Examiner has failed to meet this burden. Although the Examiner has tried in several different ways to describe how one skilled in the art would have be motivated to modify Battersby to incorporate the lenses of Stoner, these attempts have fallen short.

For example, in the basic rejection made in both the first and second office actions, the Examiner states:

> It would then have been obvious to one skilled in the art at the time of the invention being made to apply the teachings of Stoner to modify the autostereoscopic display system of Battersby accordingly for the benefit of using alternative means and arrangement that does not require to set up electric field as for liquid crystal material to change the function of the lenticular means so that more variety of choices of the index matching fluid may be utilized to allow the system be switched between stereoscopic and regular 2D display mode.

(Paper No. 5 at pp. 6-7; Paper No. 8 at p. 4). It is disingenuous and overly simplistic to say that an alternative design, not using an electric field, but having an index matching fluid, would be desirable. Alternatives are always desirable. However, Battersby specifically contemplates the use of liquid crystal material, which requires the application of an electrical potential to switch states. Battersby does not contemplate the use of other lens schemes, even though other designs were known and available. For example, U.S. Patent No. 3,600,063 to Bowen (cited by the Examiner in Paper No. 10) illustrates the use of an index matching fluid with a lenticular sheet. By introducing a liquid into the space behind the lenticules, then varying the pressure, the transmitted beam angle may be varied. (Col. 1:45 – col. 2:5).

Battersby contemplated an electro-optical solution to the problem of switching between planar and stereo modes. Stoner has no explicit or implicit teaching or suggestions with regard to that issue, but instead, is simply directed to corrective lenses for like eyeglasses. (Stoner at Col. 1:12 0 col. 4:12). Stoner's method does provide a switching lens, but does not suggest the desirability or motivation to provide such a lens on a larger scale, e.g. with flat panel displays, for the purpose of switching between planar and stereo states. Further, Bower had provided years earlier the express teaching of introducing a fluid behind lenticules for varying the transmitted beam angle, yet neither Battersby nor Stoner contemplated taking that teaching a step farther to create a switching structure for a stereoscopic system.

For many inventions, it is the combination of well known parts in an arrangement no one had thought of before that produces the patentable improvement, as well as the reaction by some: "Why didn't I think of that?" With the benefit of hindsight, many such inventions appear obvious. However, applicant submits it has created a patentable improvement by combining well known elements in a new way. The present invention simply applies the well known concept of a fluid lens to the problem of switching viewing modes in an autostereoscopic system. No one had done this before, even though Bowen had used index matching fluid in a lenticular application more than 30 years ago. Battersby came along more recently and went in a different direction, focusing soley on an electro-optical solution. Stoner was completely unconcered with the stereoscopic application.

In the second office action, the Examiner attempts to further support the case for obviousness by stating that "one skilled in the art certainly will be motivated to design the display device with different design of the lenticular lens means for the benefit of simply having more options to facilitate the display device. Furthermore, fluid lens is very common lens element in the art. Such modification is certainly within general skill of the the art." (Paper No. 8 at p. 6). However, applicant submits that "***more options***" is not an adequate teaching, suggestion, or motivation to make the proposed combination.

Finally, in the third and final office action, the Examiner states:

> The ideas of using a *fluid lens* . . . as suggested by teachings of Stoner as an alterative design to provide the activation and deactivation of the lens is considered to be **obvious modification to one skilled in the art**. Since the fluid lens design is very well known and common to one skilled in the art and such modification

> only required only general knowledge in the art at time of invention. The combination of the cited references therefore is not based upon hindsight reasoning.

(Paper No. 10 at p. 3). Applicant submits that in every instance, the Examiner's conclusions regarding obviousness are in error and not supported by adequate facts and reasoning. The combination of Battersby and Stoner is simply inadequate to

2. The Examiner Has Used Improper Hindsight Reasoning

As noted above, the PTO has the burden of establishing a prima facie case of obviousness under 35 USC §103. It must show that some objective teaching in the prior art or knowledge generally held by one of ordinary skill would lead an individual to combine the relevant teachings of the references. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Therefore, a combination of relevant teachings alone is insufficient grounds to establish obviousness, absent some teaching or suggestion to do so. *Id.* at 1075. In this case, the Examiner has not pointed to any objective teaching or suggestion in the cited references that would lead an artisan to come up with the claimed invention.

The applicants recognize that many of the features of their invention are disclosed in various of the references cited by or to the Examiner during prosecution of this application. Nevertheless, none of the references teaches the unique combination of features called for in the claims. It is impermissible hindsight reasoning for the Examiner to pick a feature here and there from among the references to construct a hypothetical combination which obviates the claims.

> It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. [*citation omitted*] The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

In re Gordon, 18 USPQ.2d 1885, 1888 (Fed. Cir. 1991).

A large number of devices may exist in the prior art where, if the prior art be disregarded as to its content, purpose, mode of operation and general context, the several elements claimed by the applicant, if taken individually, may be disclosed. However, the important thing to recognize is that the reason for combining these elements in any way to meet applicants' claims

only becomes obvious, if at all, when considered from hindsight in the light of the application disclosure. The Federal Circuit has stressed that the "decisionmaker must step backward in time and into the shoes worn by a person having ordinary skill in the art when the invention was unknown and just before it was made." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566 (Fed. Cir. 1987). To do otherwise would be to apply hindsight reconstruction, which is strongly discouraged by the Federal Circuit. *Id.* at 1568.

> To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553 (Fed. Cir. 1983). Therefore, without some reason or suggestion in the references to combine the cited prior art teachings, the Examiner has failed to establish a prima facie case for obviousness.

The argument is sometimes made, citing *In re Sernaker*, 702 F.2d 989 (Fed. Cir. 1983) and *In re Nilssen*, 851 F.2d 1401 (Fed. Cir. 1988), that no express suggestion in the references for the combination of references is necessary. However, this begs the question. The issue is whether the references as a whole suggest the particular combination being used to obviate the claims. When the Examiner must resort to selecting elements of various teachings in order to form the claimed invention, he must establish first that there is a suggestion or motivation in the prior art to make the particular selection made by the applicant. *In re Gorman*, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991). The Examiner has not established any legitimate suggestion or motivation to make the cited combination – he has only asserted that it would be desirable to have an alternative design. There must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the proposed combination. *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462 (Fed. Cir. 1984).

Simply stating that the invention would have been obvious to a person of ordinary skill is also insufficient, for the assertion must be supported by clear and convincing evidence. *Panduit, supra*, 810 F.2d at 1568. The Examiner merely stated that the invention would be obvious in light of the proposed combination, and did not provide clear and convincing evidence to support

this assertion. Furthermore, it is important to stress that obviousness under Section 103 is not established if a person of ordinary skill might find it obvious to try various combinations of the relevant teachings. *In re Geiger*, 815 F.2d 686, 688 (Fed. Cir. 1987).

The Examiner has failed to avoid the insidious effects of hindsight reasoning in making the combination of Battersby and Stoner, and for that reason, all of his rejections should be reversed.

3. *All Claims Are Patentable*

Independent claim 5 is written in Jepson format, with the preamble defining a system wherein "*a lenticular screen is aligned in juxtaposition with a display screen.*" The specific improvement claimed is "*a closed chamber affixed over the lenticules and a fluid reservoir in communication with the closed chamber and storing an optically clear liquid that is introduced and removed from the closed chamber.*"

Applicant acknowledges that Battersby discloses a lenticular screen aligned in juxtaposition with a display screen, and that a closed chamber is formed over the lenticules to retain a liquid crystal material. However, as the Examiner acknowledges, the liquid crystal material is not introduced and removed from the closed chamber. (Paper No. 5 at p. 6). Further, the liquid crystal material is not "an optically clear liquid" as required by the claim – it is certainly not optically clear when there is no electrical potential applied to the electrodes.

The Examiner asserts in essence that it would merely be a matter of design choice for the artisan to substitute a different lens design into the system of Battersby to activate and deactivate the lens, such as the lens provided by Stoner. However, applicant submits that there is no teaching, suggestion, or motivation, either express or inherent, in either Battersby or Stoner to modify the stereoscopic system of Battersby to incorporate the lenses of Stoner, and further, that the Exmainer has used improper hindsight to make the combination.

As discussed above, the use of an optical fluid to change lens properties was known well before Stoner. *See*, for example, U.S. Patent No. 3,600,063 to Bowen (cited by the Examiner), and U.S. Patent No. 5,774,273 to Borhnhorst. However, prior to applicant's disclosure, despite the existing knowledge that a lens element could be neutralized by using a fluid component that matched the len's index of refraction, no one had thought to use the introduction and removal of

an optical fluid to switch a stereoscopic display system having a lenticular screen between stereo and planar viewing modes. Thus, claim 5 is believed to be patentable, and the Examiner should be reversed.

Claim 6-7 are dependent from claim 5 and for the same reasons are not obvious in light of the proposed combination.

Independent claim 8 is an apparatus claim that requires in part: "*a closed chamber formed over the lenticules, a fluid reservoir coupled to the closed chamber, and a transfer valve coupled to the fluid reservoir for introducing and removing an optically clear fluid from the chamber.*" For the same reasons discussed with reference to claim 5, applicant believes that claim 8 is likewise patentable, and the Examiner should be reversed.

Claims 9-10 and 12-17 are dependent from claim 8 and for the same reasons are not obvious in light of the proposed combination.

Claim 18 is directed to a method including the steps: "*forming a closed chamber over the lenticules, introducing an optically clear fluid into a portion of the closed chamber to thereby deactivate the lenticular screen, and removing the optically clear fluid from the closed chamber to thereby activate the lenticular screen.*" For the same reasons discussed with reference to claim 5, applicant believes that claim 18 is likewise patentable, and the Examiner should be reversed.

Claims 19-20 are dependent from claim 18 and for the same reasons are not obvious in light of the proposed combination.

III. APPELLANTS' CLAIMS ARE PATENTABLE OVER THE COMBINATION OF BATTERSBY, STONER AND GOTO

A. The Teachings of Goto

Goto is cited for its disclosure of the use of an antireflective coating on the lenses, as claimed by applicant in claims 11 and 21. However, Goto does not overcome the inadequacy of the combination of Battersby and Stoner, i.e., there is still no teaching, suggestion or motivation to substitute the fluid lens of Stoner in the switching structure of Battersby.

B. The Combination Of Battersby, Stoner And Goto Does Not Render Obvious Dependent Claims 11 And 21

Claims 11 and 21 are dependent from claim 18 and for the same reasons are not obvious in light of the proposed combination.

CONCLUSION

For these reasons given above, Appellants submit that all pending claims are patentably distinct over the cited prior art. Therefore, the Examiner is in error and should be reversed.

Respectfully submitted,

DERGOSITS & NOAH LLP

Dated: 4/22/05

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APPENDIX

1-4. cancelled

5. In an autostereoscopic display system whereby a lenticular screen is aligned in juxtaposition with a display screen, wherein the lenticular screen has lenticules on one side thereof facing the display screen, wherein the improvement comprises a closed chamber affixed over the lenticules and a fluid reservoir in communication with the closed chamber and storing an optically clear fluid that is introduced and removed from the closed chamber.

6. The autostereoscopic display system of claim 5, further comprising a fluid pump and a control valve coupled to the fluid reservoir and adapted to introduce and remove the fluid from the closed chamber.

7. The autostereoscopic display system of claim 5, wherein the fluid reservoir is a syringe having a handle for transferring fluid to and from the syringe.

8. An autostereoscopic lenticular screen apparatus, comprising:

a display screen having a display surface,

a lenticular screen having lenticules disposed on one side thereof and a smooth surface on the other side thereof, said lenticular screen being held in juxtaposition to the display surface,

a closed chamber formed over the lenticules,

a fluid reservoir coupled to the closed chamber, and

a transfer valve coupled to the fluid reservoir for introducing and removing an optically clear fluid from the chamber.

9. The autostereoscopic lenticular screen apparatus of claim 8, wherein the lenticular screen is oriented with the lenticules facing outwardly away from the display screen.

10. The autostereoscopic lenticular screen apparatus of claim 8, wherein the lenticular screen is oriented with the lenticules facing inwardly toward the display screen.

11. The autostereoscopic lenticular screen apparatus of claim 10, wherein the smooth surface of the lenticular screen is coated with an antireflective material.

12. The autostereoscopic lenticular screen apparatus of claim 8, wherein the fluid is a fluoropolymer.

13. The autostereoscopic lenticular screen apparatus of claim 8, wherein the fluid has an index of refraction that is similar to that of the lenticules.

14. The autostereoscopic lenticular screen apparatus of claim 13, wherein the fluid has an index of refraction that is identical to that of the lenticules.

15. The autostereoscopic lenticular screen apparatus of claim 8, wherein the lenticular screen is a substrate having lenticules disposed on one side thereof.

16. The autostereoscopic lenticular screen apparatus of claim 15, wherein the substrate is glass.

17. The autostereoscopic lenticular screen apparatus of claim 8, wherein the fluid reservoir is a syringe and the transfer valve is a pump handle on the syringe.

18. A method for switching an autostereoscopic display system between a planar viewing mode and a stereoscopic viewing mode, wherein a lenticular screen having lenticules disposed on one side thereof is aligned in juxtaposition with a display screen, comprising:

forming a closed chamber over the lenticules,

introducing an optically clear fluid into a portion of the closed chamber to thereby deactivate the lenticular screen, and

removing the optically clear fluid from the closed chamber to thereby activate the lenticular screen.

19. The method for switching an autostereoscopic system as in claim 18, wherein the lenticular screen is oriented with the lenticules facing outwardly away from the display screen.

20. The method for switching an autostereoscopic system as in claim 18, wherein the lenticular screen is oriented with the lenticules facing inwardly toward the display screen.

21. The method for switching an autostereoscopic system as in claim 20, wherein the lenticular screen has a smooth surface opposite the one side which is coated with an antireflective material.

22. cancelled.